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| CHENG, PETER L | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/705,473 | LAMY ET AL. | |
| | Examiner | Art Unit | |
| | PETER L. CHENG | 2625 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on _24 June 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) _1,4-11,13-32,34,35 and 37-48_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1,4-11,13-32,34,35 and 37-48_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **6/24/2008** has been entered.

## *Specification*

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

> The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.
>
> The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The usage of the word **wherein** in **lines 2**, **4** and **7** should be avoided.

## *Claim Objections*

3. Claim 9 is objected to because of the following informalities:

- **Line 3: "<u>the</u> spectral color data"** lacks antecedent basis; suggest replacing with **spectral color data**;

4. Claim 21 is objected to because of the following informalities:

- **Lines 2 - 3: "<u>the</u> memory"** lacks antecedent basis; suggest replacing with **a memory**;

5. Claim 25 is objected to because of the following informalities:

- **Lines 6 - 7:** for clarity, suggest moving the phrase **in order to achieve particular color reproduction simulation data** after the word **processor** in **line 3**;

6. Claim 37 is objected to because of the following informalities:

- **Line 2:** per **claim 1**, **lines 5 – 6,** it is assumed that applicant intended to cite **the plurality of <u>different</u> colors** instead of **the plurality of colors**;

7. Claim 38 is objected to because of the following informalities:

- **Line 3:** suggest replacing **all <u>of the</u> colors of the color gamut** with **all colors of the color gamut**;

8. Claim 39 is objected to because of the following informalities:

- **Line 3:** suggest replacing **all <u>of the</u> colors of the color gamut** with **all colors of the color gamut**;

9. Claim 40 is objected to because of the following informalities:

- **Lines 1 - 2:** suggest replacing **within <u>the at least a part</u> of the color gamut** with **within <u>at least part</u> of the color gamut**;

10. Claim 41 is objected to because of the following informalities:

- **Line 2:** per **claim 18**, **line 5,** it is assumed that applicant intended to cite **the plurality of <u>different</u> colors** instead of **the plurality of colors**;

11. Claim 42 is objected to because of the following informalities:

- **Line 3:** suggest replacing **all <u>of the</u> colors of the color gamut** with **all colors of the color gamut**;

12. Claim 43 is objected to because of the following informalities:

- **Line 3:** suggest replacing **all <u>of the</u> colors of the color gamut** with **all colors of the color gamut**;

13. Claim 44 is objected to because of the following informalities:

- **Line 2:** suggest replacing **within the at least a part of the color gamut** with **within at least part of the color gamut**;

14. Claim 45 is objected to because of the following informalities:

- **Line 2:** per **claim 29**, **lines 9 - 10,** it is assumed that applicant intended to cite **the plurality of different colors** instead of **the plurality of colors**;

15. Claim 46 is objected to because of the following informalities:

- **Line 3:** suggest replacing **all of the colors of the color gamut** with **all colors of the color gamut**;

16. Claim 47 is objected to because of the following informalities:

- **Line 3:** suggest replacing **all of the colors of the color gamut** with **all colors of the color gamut**;

17. Claim 48 is objected to because of the following informalities:

- **Line 2:** suggest replacing **within the at least a part of the color gamut** with **within at least part of the color gamut**;

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

20. Claims 1, 4 – 11, and 13 – 32, 34, 35 and 37 - 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over **CHAN [US Patent 7,046,396 B2]** in view of **SENN et al. [US Patent 7,280,118 B2]**.

As for claim 1, CHAN teaches a method for generating a digital color standard system for the generation or reproduction of standardized colors

> [CHAN provides a system "for identifying a desired ink color and a formulation for a matching ink color"; **col. 1, lines 56 - 58]**,

comprising:

**a) providing a color gamut <u>including a saturation coordinate</u>;**

**b) dividing the color gamut into a plurality of discrete spectral color values**

[*These limitations correspond* to a database of discrete spectral color values. CHAN teaches that a "spectrophotometer 14, color monitor 16, and viewing booth 18 are used … to create a color data base associated with a set of ink base colors"; **col. 3, lines 43 – 46**, and cites, "The database is prepared by measuring", with the spectrophotometer, "the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set"; **col. 5, lines 38 – 45.**

In addition, CHAN teaches that "a variety of methods for inputting the desired color is envisioned. In one embodiment, the desired color may be input as appropriate coordinates of a color space. The color coordinates can be obtained spectrophotometrically … and expressed in coordinates such as the color coordinates such as X, Y, Z or L*, a*, b*, or in cylindrical coordinates r, Θ, l or <u>L*, C*, H*</u>"; **col. 4, lines 46 – 53.**

The CIE L*C*H* system includes a saturation coordinate (C*).],

***wherein at least one of the discrete spectral color values includes a plurality of different colors at least including a first color with a first saturation,***

***wherein at least another of the discrete spectral color values includes the first color with a second saturation different than the first saturation,***

***and wherein over at least a part of the color gamut, the discrete spectral color values are substantially equidistant to each other with respect to the color gamut;***

**c) digitizing the discrete spectral color values**

**[**Computer databases store information as digitized, discrete values. As noted previously, CHAN teaches the use of a spectrophotometer to measure "print samples prepared from the ink color base set" which are then stored in a database**];**

***and d) representing at least one of the digitized discrete spectral color values by means of ~~at least one~~ a reflectance curve specified in regular intervals.***

~~**and wherein over at least a part of the color gamut, the digitized color spectral values are substantially equidistant to each other with respect to the color gamut.**~~

However, CHAN *does not specifically teach*

***wherein at least one of the discrete spectral color values includes a plurality of different colors at least including a first color with a first saturation,***

***wherein at least another of the discrete spectral color values includes the first color with a second saturation different than the first saturation,***

***and wherein over at least a part of the color gamut, the discrete spectral color values are substantially equidistant to each other with respect to the color gamut;***

***and d) representing <u>at least one of</u> the digitized discrete spectral color values by means of ~~at least one~~ <u>a</u> reflectance curve specified in regular intervals.***

SENN et al. teach a "system and method for the production of a color palette"; **col. 3, lines 3 – 4.** An initial step in the production of a color palette divides a color space. "The CIE-LAB-color space is initially divided into a grid of color points (Lab coordinates)"; **col. 3, lines 41 – 42.** In this way, "a table of color coordinates with their corresponding <u>*spectral curves*</u> is generated, thus becoming a color palette"; **col. 5, lines 39 – 41.** SENN et al. further teach that the division of the color space may also be performed via *polar coordinates*. "To improve the <u>*visual equidistance*</u>, regular grids (<u>polar coordinates L, C, h</u>) can also be applied (L = brightness, lightness; <u>C = saturation, chroma</u>; and h = color tone, hue)"; **col. 3, lines 52 – 54.** "The formulation, instead of being based on squares or quadrilaterals, is conducted on the basis of circles of constant color saturation (i.e., chroma). In the simplest scenario, the radii are selected as a multiple of a base radius (r, 2r, 3r, ...)"; **col. 5, lines 45 – 49.**

That is, SENN et al. teach *dividing the color gamut into a plurality of discrete spectral color values*

***<u>wherein at least one of the discrete spectral color values includes a plurality of different colors at least including a first color with a first saturation</u>***

**[**For example, the *"at least one of the discrete spectral color values*" may correspond to a plurality of different colors with a chroma radius of "2r" including a "*first color*" (or "first hue")**],**

***<u>wherein at least another of the discrete spectral color values includes the first color with a second saturation different than the first saturation</u>***

**[**For example, the *"at least another of the discrete spectral color values"* may correspond to the same plurality of different colors (or hues) with a chroma radius of "3r"**],**

***<u>and wherein over at least a part of the color gamut, the discrete spectral color values are substantially equidistant to each other with respect to the color gamut</u>***

**[**As noted, an objective of selecting grid points is to "improve the visual equidistance" and the discrete color values may be separated by a "multiple of a base radius"**]*;***

***and d) representing <u>at least one of</u> the digitized discrete spectral color values by means of ~~at least one~~ <u>a</u> reflectance curve specified in regular intervals***

**[**As noted, the objective is to generate “a table of color coordinates with their corresponding *spectral curves*” which becomes a color palette**]**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of SENN et al. with those of CHAN so that the colors selected for the color database (i.e., from a “color palette”) would have a property of being visually perceived as being spatially equidistant. On the contrary, if the selected colors did not have this property, the size of the color database would be unnecessarily larger than needed due to having “duplicate colors” which appeared the same.

Interestingly, **RICE [US Patent 6,563,510]**, as cited in the previous office action, also divides the color gamut using a *polar coordinate color system* (i.e., the Munsell color space; **Figs. 1 – 5**) *with a saturation coordinate* (i.e., “chroma”). However, since RICE’s invention concerns a “color coordinating system”, the color palette is organized by *hue* (instead of *chroma* or *saturation*). RICE’s selected colors (i.e., “color information”) which are stored in a “database” **48** may be represented by “any color-order system”; **col. 8, lines 13 – 14.** Such systems includes “hue, value and chroma”, CIELAB or “any other color identification system”; **col. 8, lines 14 – 16.**

Regarding claim 4, CHAN further teaches the method according to claim 1, wherein

**the discrete spectral color values or the digitized discrete spectral color values are adapted to a color recording capability of a particular color recording process or a particular color recording device**

**[**CHAN teaches that the "second computer" may also consider "color recording characteristics" for the type of "recording substrate", "color reproduction characteristics" for the type of "color material", and the "color appearance characteristics" for the "color reproducing process". That is, the <u>color data</u> that is stored on the "second computer" and is transmitted to the "first computer" is data which takes into account these various characteristics.

CHAN cites, "It is especially preferred to include additional information relating to the <u>print substrate</u>, <u>printing equipment</u>, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, <u>print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed</u>, and/or type of ink or ink properties desired"; **col. 4, lines 30 – 37.**

Therefore, CHAN teaches adapting the color values to a color recording capability of a particular color recording process or a particular color recording device (i.e., a type of "print process", or "printing equipment")**].**

Regarding claim 5, CHAN further teaches the method according to claim 4, wherein

**the particular color recording device is one selected from the group consisting of an ink jet printer and a rotary printing press**

**[**As noted for claim 4, CHAN cites various examples of print processes which include offset, gravure, sheet-fed, and flexographic. Both offset and flexographic are types of "rotary printing"**].**

Regarding claim 6, CHAN further teaches the method according to claim 1, wherein

**at least one of the discrete spectral color values and the digitized discrete spectral color values is adapted to a particular recording substrate**

**[**As noted for claim 4, CHAN teaches that the color values are adapted to a particular recording (or "print") substrate.

CHAN cites, "It is especially preferred to include additional information relating to the <u>print substrate</u>, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, <u>type of substrate, color of substrate</u>, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, and/or type of ink or ink properties desired"; **col. 4, lines 30 – 37].**

Regarding claim 7, CHAN further teaches the method according to claim 1, wherein

**at least one of the discrete spectral color values and the digitized discrete spectral color values is adapted to a particular recording material**

**[**As noted for claim 4, CHAN teaches that the color values are adapted to a particular recording material (i.e., ink or colorant).

CHAN cites, “It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, <u>and/or type of ink or ink properties desired</u>”; **col. 4, lines 30 – 37].**

Regarding claim 8, CHAN further teaches a method according to claim 7, wherein

**said particular recording material is one selected from the group consisting of an ink and <u>a</u> toner**

**[**As noted for claim 7, CHAN teaches that the recording material may be a type of ink**].**

Regarding claim 9, CHAN further teaches the method according to claim 1, wherein

**particular colors of particular image areas are scanned by means of a spectral measurement device and the particular colors or the spectral color data of the particular colors are assigned to the digitized discrete spectral color values for further processing**

**[**CHAN teaches that a “spectrophotometer 14, color monitor 16, and viewing booth 18 are used … to create a color data base associated with a set of ink base colors”; **col. 3, lines 43 – 46**, and cites, “The database is prepared by measuring”, with the spectrophotometer, “the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set”; **col. 5, lines 38 - 45].**

Regarding claim 10, CHAN further teaches the method according to claim 1, wherein

**at least one of the discrete spectral color values and the digitized discrete spectral color values is set in a relation to pre-defined light conditions**

**[**CHAN teaches that the color values contained in the database may also take into account various lighting conditions. CHAN cites, “Because print color can appear different when viewed under different light sources, it is preferred to include in the database color information for the colors as they would appear

under different light sources, for example in sunlight, in D65 daylight, cool white fluorescent light, and incandescent light"; **col. 6, lines 23 - 28].**

Regarding claim 11, CHAN further teaches the method according to claim 1, wherein **the appearance of at least one of a discrete spectral color value and a digitized discrete spectral color value on a particular recording substrate or recording device is set into a relationship to pre-defined light conditions**

**[**As noted for claim 4, CHAN teaches adapting the color values to a color recording capability of a particular color recording process or a particular color recording device (i.e., a type of "print process", or "printing equipment").

As noted for claim 6, CHAN teaches that the color values are adapted to a particular recording substrate.

As noted for claim 10, CHAN teaches that the color values contained in the database may also take into account various lighting conditions.

Therefore, CHAN teaches that the color values contained in the database are related by a recording process (or device), recording substrate, and lighting conditions**].**

Regarding claim 13, CHAN further teaches the method according to claim 1, wherein

**a recording substrate is spectrally measured to provide a recording substrate-specific spectral color data set, and at least one of the discrete spectral color values and the digitized discrete spectral color values is adjusted according to said recording substrate-specific spectral color data set**

**[**As noted previously, CHAN teaches "that color can vary for an ink depending upon the substrate being printed"; **col. 7, lines 53 – 54.** CHAN further teaches that the "substrate color" may also be input as "spectral data"; **col. 7, lines 65 – 66.** CHAN's system includes a spectrophotometer which may be used to obtain the spectral data of the recording substrate.

The "adjustment" to the color values corresponds to the "calculation of the formulation" which "preferably takes into account the color shift, if any, expected for the substrate being printed"; **col. 7, lines 60 - 62].**

Regarding claim 14, CHAN further teaches the method according to claim 1, wherein

**at least one color of a specimen is spectrally measured and spectral color data is assigned to at least one of a matching discrete spectral color value and a matching digitized discrete spectral color value**

[CHAN teaches that “a variety of methods for inputting the desired color” (of a specimen) “is envisioned”; **col. 4, lines 46 – 47.** However, “more accurate color matching can be obtained using a spectrophotometer”; **col. 4, lines 57 – 58.**

Furthermore, CHAN teaches that a “color match” may be determined “by the comparison of the reflectance values in the visible spectrum for the desired color and the color identified by the color matching program. A least squares calculation can be done to determine the ink formulation that will have the spectral curve with the closest fit to the spectral curve of the desired color standard, where the spectral curve for the ink formulation may be extrapolated from information of measured spectral curves in the data”; **col. 6, lines 33 – 41].**

Regarding claim 15, CHAN further teaches the method according to claim 1, wherein **the digitized discrete spectral color values are collected to provide a digital color book of at least one chromaticity**

[CHAN teaches that the desired input color may be selected from a “library of colors shown on the customer’s computer monitor”; **col. 4, lines 59 – 61**. Furthermore, “the colors may be shown as an array of color chips or boxes, as a continuum of colors such as a color space, or in any other suitable way”; **col. 4, line 66 – col. 5, line 1.** The “color library”, when displayed as an array of color

chips (as is typical in a color "swatch book"), corresponds to the "digital color book"**]**.

Regarding claim 16, CHAN further teaches the method according to claim 1, *further comprising processing the digitized discrete spectral color values,* wherein

**said processing includes *at least one* of the following processing steps:**

**assigning the digitized discrete spectral color values to color values of images,**

**transmitting at least one digitized discrete spectral color value between remote terminals,**

**and printing out at least one digitized discrete spectral color value**

**[**As noted for claim 1, "processing" of the digitized color values may include the transmission of such values from the "second computer" to the "first computer", including the display of such values on a monitor.

"The second computer **10** (illustrated as the server) selects an ink formulation and <u>transmits</u> the color data associated with the selected formulation to the first computer **4**"; **col. 3, lines 31 – 33.**

Furthermore, a software package "converts the spectral data of a color that is input from the computer 4 or the <u>database</u> software 22 to the digital information

that will <u>produce</u> the same color on the screens of monitor 6 and 16"; **col. 3, lines 52 - 55].**

Regarding claim 17, CHAN further teaches the method according to claim 1, further comprising

**using a data carrier to carry at least one of ~~said~~ <u>the</u> digitized discrete spectral color values**

**[**"The second computer 10 (illustrated as the server) selects an ink formulation and <u>transmits</u> the color data associated with the selected formulation to the first computer 4"; **col. 3, lines 31 – 33.**

The "data carrier" corresponds to the "second computer" (or server).**].**

As for claim 18, CHAN teaches a computer system for generating a digital color standard system for the generation or reproduction of standardized colors

**[**CHAN provides a system "for identifying a desired ink color and a formulation for a matching ink color"; **col. 1, lines 56 - 58]**,

comprising a processor

**[Fig. 1** "server" (or "second computer") **10]**

that is programmed to

**a) divide a color gamut <u>having a saturation coordinate</u>**

**into a plurality of discrete spectral color values**

[These limitations correspond to a database of discrete spectral color values. CHAN teaches that a "spectrophotometer 14, color monitor 16, and viewing booth 18 are used ... to create a color data base associated with a set of ink base colors"; **col. 3, lines 43 – 46**, and cites, "The database is prepared by measuring", with the spectrophotometer, "the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set"; **col. 5, lines 38 – 45.**

In addition, CHAN teaches that "a variety of methods for inputting the desired color is envisioned. In one embodiment, the desired color may be input as appropriate coordinates of a color space. The color coordinates can be obtained spectrophotometrically ... and expressed in coordinates such as the color coordinates such as X, Y, Z or L*, a*, b*, or in cylindrical coordinates r, Θ, l or <u>L*, C*, H*</u>"; **col. 4, lines 46 – 53.**

The CIE L*C*H* system includes a saturation coordinate (C*).],

***wherein at least one of the discrete spectral color values includes a plurality of different colors at least including a first color with a first saturation,***

***wherein at least another of the discrete spectral color values includes the first color with a second saturation different than the first saturation,***

***and wherein over at least a part of the color gamut, the discrete spectral color values are substantially equidistant to each other with respect to the color gamut,***

**b) digitize the discrete spectral color values**

**[**Computer databases store information as digitized, discrete values. As noted previously, CHAN teaches the use of a spectrophotometer to measure "print samples prepared from the ink color base set" which are then stored in a database**],**

***wherein <u>at least one of</u> the digitized discrete spectral color values ~~are~~ <u>is</u> representable by means of ~~at least one~~ <u>a</u> reflectance curve specified in regular intervals;***

**~~and wherein over at least a part of the color gamut, the digitized discrete spectral color values are substantially equidistant to each other with respect to the color gamut;~~**

**and c) process the digitized discrete spectral color values.**

**[**"Processing" of the digitized color values may include the transmission of such values from the "second computer" to the "first computer", including the display of such values on a monitor.

"The second computer **10** (illustrated as the server) selects an ink formulation and <u>transmits</u> the color data associated with the selected formulation to the first computer **4**"; **col. 3, lines 31 – 33.**

Furthermore, a software package "converts the spectral data of a color that is input from the computer 4 or the <u>database</u> software 22 to the digital information that will <u>produce</u> the same color on the screens of monitor 6 and 16"; **col. 3, lines 52 - 55]**

However, CHAN *does not specifically teach*

***wherein at least one of the discrete spectral color values includes a plurality of different colors at least including a first color with a first saturation,***

***wherein at least another of the discrete spectral color values includes the first color with a second saturation different than the first saturation,***

***and wherein over at least a part of the color gamut, the discrete spectral color values are substantially equidistant to each other with respect to the color gamut,***

***wherein at least one of the digitized discrete spectral color values ~~are~~ is representable by means of ~~at least one~~ a reflectance curve specified in regular intervals;***

SENN et al. teach a "system and method for the production of a color palette"; **col. 3, lines 3 – 4.** An initial step in the production of a color palette divides a color space. "The CIE-LAB-color space is initially divided into a grid of color points (Lab coordinates)"; **col. 3, lines 41 – 42.** In this way, "a table of color coordinates with their corresponding *spectral curves* is generated, thus becoming a color palette"; **col. 5,**

**lines 39 – 41.** SENN et al. further teach that the division of the color space may also be performed via *polar coordinates*. "To improve the *visual equidistance*, regular grids (polar coordinates L, C, h) can also be applied (L = brightness, lightness; C = saturation, chroma; and h = color tone, hue)"; **col. 3, lines 52 – 54.** "The formulation, instead of being based on squares or quadrilaterals, is conducted on the basis of circles of constant color saturation (i.e., chroma). In the simplest scenario, the radii are selected as a multiple of a base radius (r, 2r, 3r, ...)"; **col. 5, lines 45 – 49.**

That is, SENN et al. teach *dividing the color gamut into a plurality of discrete spectral color values*

> ***wherein at least one of the discrete spectral color values includes a plurality of different colors at least including a first color with a first saturation***
>
> **[**For example, the *"at least one of the discrete spectral color values*" may correspond to a plurality of different colors with a chroma radius of "2r" including a "*first color*" (or "first hue")**],**
>
> ***wherein at least another of the discrete spectral color values includes the first color with a second saturation different than the first saturation***

**[**For example, the *"at least another of the discrete spectral color values"* may correspond to the same plurality of different colors (or hues) with a chroma radius of "3r"**]*,***

***<u>and wherein over at least a part of the color gamut, the discrete spectral color values are substantially equidistant to each other with respect to the color gamut</u>***

**[**As noted, an objective of selecting grid points is to "improve the visual equidistance" and the discrete color values may be separated by a "multiple of a base radius"**]*;***

***wherein <u>at least one of</u> the digitized discrete spectral color values ~~are~~ <u>is</u> representable by means of ~~at least one~~ <u>a</u> reflectance curve specified in regular intervals;***

**[**As noted, the objective is to generate "a table of color coordinates with their corresponding *<u>spectral curves</u>*" which becomes a color palette**]*.***

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of SENN et al. with those of CHAN so that the colors selected for the color database (i.e., from a "color palette") would have a property of being visually perceived as being spatially equidistant. On the contrary, if the

selected colors did not have this property, the size of the color database would be unnecessarily larger than needed due to having “duplicate colors” which appeared the same.

Interestingly, **RICE [US Patent 6,563,510]**, as cited in the previous office action, also divides the color gamut using a *polar coordinate color system* (i.e., the Munsell color space; **Figs. 1 – 5**) *with a saturation coordinate* (i.e., “chroma”). However, since RICE’s invention concerns a “color coordinating system”, the color palette is organized by *hue* (instead of *chroma* or *saturation*). RICE’s selected colors (i.e., “color information”) which are stored in a “database” **48** may be represented by “any color-order system”; **col. 8, lines 13 – 14.** Such systems includes “hue, value and chroma”, CIELAB or “any other color identification system”; **col. 8, lines 14 – 16.**

Regarding claim 19, CHAN further teaches the computer system according to claim 18, wherein

> **~~said~~ the digitized discrete spectral color values are stored in memory associated with the processor and are accessible through a data network**
>
> [The digitized color values are stored in a computer database. Regarding **Fig. 1**, “The server 10 uses three software packages, 12, 20 and 22”; **col. 3, lines 40 – 41.** “Software package C 22 includes a database of color information”; **col. 3, lines 56 – 57.**

Both software package C and its database of color values are associated with the processor (i.e., "second computer" or server **10**).

First and second computers communicate over a network. CHAN cites, as an example, the "Internet"; **col. 3, line 2].**

Regarding claim 20, CHAN further teaches the computer system according to claim 18, wherein

**~~said~~ the digitized discrete spectral color values are stored in memory associated with the processor in the form of at least one digital color swatch**

**[**CHAN teaches that the desired input color may be selected from a "library of colors shown on the customer's computer monitor"; **col. 4, lines 59 – 61.** Furthermore, "the colors may be shown as an array of color chips or boxes, as a continuum of colors such as a color space, or in any other suitable way"; **col. 4, line 66 – col. 5, line 1.** The "color library", when displayed as an array of color chips (as is typical in a color "swatch book"), corresponds to a book of "digital color swatches"**].**

Regarding claim 21, CHAN further teaches the computer system according to claim 18, wherein

**color recording characteristics data of a plurality of recording substrates are stored in the memory associated with said processor and are accessible through a data network**

[As noted for claim 4, CHAN teaches that the characteristics of recording substrates are preferably included (along with the desired input color); **col. 4, lines 30 – 39.** The processor (i.e., the "second computer" or server 10 shown in **Fig. 1**) considers these additional characteristics (along with the desired input color) when performing a color match. The resulting color match, which takes into account the characteristics of the recording substrate, is made accessible through a network to the "first computer" **(Fig. 1** reference number **4)].**

Regarding claim 22, CHAN further teaches the computer system according to claim 18, wherein

**the processor can be accessed in order to combine a standard digital color swatch book or digital standard color data with color recording substrate characteristics, to generate color reproduction simulation data**

[As noted previously, CHAN teaches "that color can vary for an ink depending upon the substrate being printed"; **col. 7, lines 53 – 54.** CHAN further teaches that the "substrate color" may also be input as "spectral data"; **col. 7, lines 65 – 66.** CHAN's system includes a spectrophotometer which may be used to obtain the spectral data of the recording substrate.

The "combination" of the color values with the characteristics of the recording substrate corresponds to the "calculation of the formulation" which "preferably takes into account the color shift, if any, expected for the substrate being printed"; **col. 7, lines 60 - 62].**

Regarding claim 23, CHAN further teaches the computer system according to claim 18, wherein

**color reproduction characteristics data for a plurality of color materials are stored in memory associated with the processor to be accessed through a data network in order to retrieve data**

**[**As noted for claim 4, CHAN teaches that the color values are adapted to a particular recording material (i.e., ink or colorant).

CHAN cites, "It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, <u>and/or type of ink or ink properties desired</u>"; **col. 4, lines 30 – 37.**

The color reproduction characteristics data for the various types of ink (i.e., "color materials") is considered by the processor (i.e., "second computer") when a color match is performed and would typically be stored in a memory accessible by the processor**].**

Regarding claim 24, CHAN further teaches the computer system according to claim 23, wherein

**said plurality of color materials are selected from the group consisting of <u>an</u> ink and <u>a</u> toner**

**[**As noted for claim 7, CHAN teaches that the recording material may be a type of ink**].**

Regarding claim 25, CHAN further teaches the computer system according to claim 18, wherein <u>at least two</u> of the following kinds of data can be accessed or combined by the processor:

**digital standard color swatch book data or digital standard color data;**

**color recording characteristics data for recording substrates;**

**color reproduction characteristics data for color materials;**

**<u>and</u> color appearance characteristics data for color reproducing processes;**

**in order to achieve particular color reproduction simulation data**

[In addition to the “database of color information for the ink base color set” (**col. 3, lines 56 - 57**), CHAN teaches that the “second computer” may also consider “color recording characteristics” for the type of “recording substrate”, “color reproduction characteristics” for the type of “color material”, and the “color appearance characteristics” for the “color reproducing process”.

CHAN cites, “It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, and/or type of ink or ink properties desired”; **col. 4, lines 30 – 37.**

CHAN teaches “that color can vary for an ink depending upon the substrate being printed”; **col. 7, lines 53 – 54**. CHAN further teaches that the “substrate color” may also be input as “spectral data”; **col. 7, lines 65 – 66**. CHAN’s system includes a spectrophotometer which may be used to obtain the spectral data of the recording substrate.

CHAN teaches the "combination" of the digital standard color data (i.e., the database) with characteristics of the recording substrate which corresponds to the "calculation of the formulation" that "preferably takes into account the color shift, if any, expected for the substrate being printed"; **col. 7, lines 60 - 62]**

Regarding claim 26, CHAN further teaches the computer system according to claim 25, wherein

**said color reproducing processes include at least one selected from the group consisting of printing processes, electro-photographical color copying processes and screens**

**[**CHAN teaches a color matching system which can be applied to "offset lithography" and other processes, such as "gravure, flexography, and silk screen printing"; **col. 8, lines 25 – 29].**

Regarding claim 27, CHAN further teaches the computer system according to claim 18, wherein

**color reproduction simulation data can be browsed by a remote terminal**

**[**CHAN teaches "the color of the selected formulation can be displayed on the customer monitor for approval by the customer. In this context, the 'customer' can be the printer and/or the print buyer and/or a designer of packaging or other printed media"; **col. 6, lines 42 - 45].**

Regarding claim 28, CHAN further teaches the computer system according to claim 18, wherein

**color recording characteristics data for recording substrates,**

**color reproduction characteristics data for color materials,**

***or* color appearance characteristics data for color reproducing processes**

**can be transmitted to a data carrier or device to be stored, in order to be accessible or combinable by remote terminals, to achieve particular color reproduction simulation data**

[CHAN teaches that the "second computer" may also consider "color recording characteristics" for the type of "recording substrate", "color reproduction characteristics" for the type of "color material", and the "color appearance characteristics" for the "color reproducing process". That is, the <u>color data</u> that is stored on the "second computer" and is transmitted to the "first computer" is data which takes into account these various characteristics.

In addition to specifying a desired input color, CHAN teaches, "It is especially preferred to include additional information relating to the print substrate, <u>printing equipment</u>, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include,

without limitation, type of substrate, color of substrate, <u>print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed</u>, and/or type of ink or ink properties desired"; **col. 4, lines 30 – 37.**

Therefore, CHAN teaches **color recording characteristics data for recording substrates** (i.e., "type of substrate" or "color of substrate"),

**color reproduction characteristics data for color materials** (i.e., "type of ink or ink properties desired"),

**or color appearance characteristics data for various color reproducing processes** (i.e., type of "print process", "printing equipment")

**can be transmitted to a data carrier** (i.e., the "second computer" 10 or server shown in Fig. 1) **or device to be stored,**

**in order to be accessible or combinable by remote terminals, to achieve particular color reproduction simulation data** (as noted for claim 25, CHAN teaches the "combination" of the digital standard color data (i.e., from the database) with characteristics of the recording substrate which corresponds to

the "calculation of the formulation" that "preferably takes into account the color shift, if any, expected for the substrate being printed"; **col. 7, lines 60 - 62].**

As for claim 29, CHAN teaches a *data carrier* system, comprising:

**a computer readable medium configured for the storage of color data thereon, and on which computer readable medium is stored color data** [CHAN teaches that a "second computer" or server **10** uses "three software packages" [**col. 3, lines 40 - 41**] and that "software package C **22** includes a database of color information for the ink base color set that will be used to manufacture the ink"; **col. 3, lines 56 – 58.** The "database" corresponds to the "computer-readable medium".

In use, a "remote location includes a spectrophotometer 2, a first computer (central processing unit) 4, a color monitor 6 electronically connected to the computer, and a viewing booth 8. The spectral data of a color sample of the desired color is obtained using the spectrophotometer 2. The color data for the desired color is input into the computer 4, which transmits the data to a second computer 10"; **col. 2, lines 52 – 59.** "The second computer 10 (illustrated as the server) selects an ink formulation and transmits the color data *associated with the selected formulation* to the first computer 4"; **col. 3, lines 31 – 33],**

CHAN further teaches that the "second computer" may also consider "color recording characteristics" for the type of "recording substrate", "color reproduction characteristics" for the type of "color material", and the "color appearance characteristics" for the "color reproducing process". That is, the color data that is stored on the "second computer" and is transmitted to the "first computer" is data which takes into account these various characteristics.

CHAN cites, "It is especially preferred to include additional information relating to the print substrate, printing equipment, and other information that may affect the color match on the substrate or performance of the ink. Examples of such information include, without limitation, type of substrate, color of substrate, print process (e.g., offset, gravure, sheetfed, flexographic, etc.), type of printing equipment, press speed, and/or type of ink or ink properties desired"; **col. 4, lines 30 – 37.**

Therefore, the following limitations are anticipated by CHAN:

**the color data being one selected from the group consisting of color recording characteristics data for recording substrates**
**[**i.e., "type of substrate, color of substrate"**],**

**color reproduction characteristics data for color materials**

**[**i.e., "type of ink or ink properties desired"**],**

**color appearance characteristics data for color reproducing processes, and combinations thereof**

**[**i.e., type of "print process", "printing equipment"**],**

**wherein the color data is generated by:**

**a) providing a color gamut <u>including a saturation coordinate</u>,**

**b) dividing the color gamut into a plurality of discrete spectral color values**

**[***These limitations correspond* to a database of discrete spectral color values. CHAN teaches that a "spectrophotometer 14, color monitor 16, and viewing booth 18 are used ... to create a color data base associated with a set of ink base colors"; **col. 3, lines 43 – 46**, and cites, "The database is prepared by measuring the color information for print samples prepared from the ink color base set and/or combinations thereof at difference concentrations or strengths. The database contains a sufficient number of color information points so that the computer can extrapolate, if necessary, the color information that would result from the different combinations of the ink base color set"; **col. 5, lines 38 – 45.**

In addition, CHAN teaches that "a variety of methods for inputting the desired color is envisioned. In one embodiment, the desired color may be input as appropriate coordinates of a color space. The color coordinates can be obtained

spectrophotometrically … and expressed in coordinates such as the color coordinates such as X, Y, Z or L*, a*, b*, or in cylindrical coordinates r, Θ, l or L*, C*, H*"; **col. 4, lines 46 – 53.**

The CIE L*C*H* system includes a saturation coordinate (C*).**],**

***wherein at least one of the discrete spectral color values includes a plurality of different colors at least including a first color with a first saturation,***

***wherein at least another of the discrete spectral color values includes the first color with a second saturation different than the first saturation,***

***and wherein over at least a part of the color gamut, the discrete spectral color values are substantially equidistant to each other with respect to the color gamut,***

**and c) digitizing the discrete spectral color values**

**[**Computer databases store information as digitized, discrete values. As noted previously, CHAN teaches the use of a spectrophotometer to measure "print

samples prepared from the ink color base set" which are then stored in a database**]**,

***wherein <u>at least one of</u> the digitized discrete spectral color values ~~are~~ <u>is</u> representable by means of ~~at least one~~ <u>a</u> reflectance curve specified in regular intervals.***

**~~and wherein over at least a part of the color gamut, the digitized discrete spectral color values are equidistant to each other with respect to the color gamut.~~**

However, CHAN *does not specifically teach*

***<u>wherein at least one of the discrete spectral color values includes a plurality of different colors at least including a first color with a first saturation,</u>***

***<u>wherein at least another of the discrete spectral color values includes the first color with a second saturation different than the first saturation,</u>***

***<u>and wherein over at least a part of the color gamut, the discrete spectral color values are substantially equidistant to each other with respect to the color gamut,</u>***

***wherein <u>at least one of</u> the digitized discrete spectral color values ~~are~~ <u>is</u> representable by means of ~~at least one~~ <u>a</u> reflectance curve specified in regular intervals.***

SENN et al. teach a "system and method for the production of a color palette"; **col. 3, lines 3 – 4.** An initial step in the production of a color palette divides a color space. "The CIE-LAB-color space is initially divided into a grid of color points (Lab coordinates)"; **col. 3, lines 41 – 42.** In this way, "a table of color coordinates with their corresponding <u>*spectral curves*</u> is generated, thus becoming a color palette"; **col. 5, lines 39 – 41.** SENN et al. further teach that the division of the color space may also be performed via *polar coordinates*. "To improve the <u>*visual equidistance*</u>, regular grids (<u>polar coordinates L, C, h</u>) can also be applied (L = brightness, lightness; <u>C = saturation, chroma</u>; and h = color tone, hue)"; **col. 3, lines 52 – 54.** "The formulation, instead of being based on squares or quadrilaterals, is conducted on the basis of circles of constant color saturation (i.e., chroma). In the simplest scenario, the radii are selected as a multiple of a base radius (r, 2r, 3r, …)"; **col. 5, lines 45 – 49.**

That is, SENN et al. teach *dividing the color gamut into a plurality of discrete spectral color values*

***<u>wherein at least one of the discrete spectral color values includes a plurality of different colors at least including a first color with a first saturation</u>***

**[**For example, the *"at least one of the discrete spectral color values*" may correspond to a plurality of different colors with a chroma radius of "2r" including a "*first color*" (or "first hue")**],**

***<u>wherein at least another of the discrete spectral color values includes the first color with a second saturation different than the first saturation</u>***

**[**For example, the *"at least another of the discrete spectral color values"* may correspond to the same plurality of different colors (or hues) with a chroma radius of "3r"**],**

***<u>and wherein over at least a part of the color gamut, the discrete spectral color values are substantially equidistant to each other with respect to the color gamut</u>***

**[**As noted, an objective of selecting grid points is to "improve the visual equidistance" and the discrete color values may be separated by a "multiple of a base radius"**]*;***

***wherein <u>at least one of</u> the digitized discrete spectral color values ~~are~~ <u>is</u> representable by means of ~~at least one~~ <u>a</u> reflectance curve specified in regular intervals.***

**[**As noted, the objective is to generate "a table of color coordinates with their corresponding *<u>spectral curves</u>*" which becomes a color palette**]**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of SENN et al. with those of CHAN so that the colors selected for the color database (i.e., from a "color palette") would have a property of being visually perceived as being spatially equidistant. On the contrary, if the selected colors did not have this property, the size of the color database would be unnecessarily larger than needed due to having "duplicate colors" which appeared the same.

Interestingly, **RICE [US Patent 6,563,510]**, as cited in the previous office action, also divides the color gamut using a *polar coordinate color system* (i.e., the Munsell color space; **Figs. 1 – 5**) *<u>with a saturation coordinate</u>* (i.e., "chroma"). However, since RICE's invention concerns a "color coordinating system", the color palette is organized by *hue* (instead of *chroma* or *saturation*). RICE's selected colors (i.e., "color information") which are stored in a "database" **48** may be represented by "any color-order system";

**col. 8, lines 13 – 14.** Such systems includes “hue, value and chroma”, CIELAB or “any other color identification system”; **col. 8, lines 14 – 16.**

Regarding claim 30, CHAN further teaches ~~a~~ the data carrier system ~~in accordance with~~ according to claim 29, wherein

> **the computer readable medium is *one selected from* the group consisting of a CD-ROM, a DVD-carrier, and a computer server**
>
> **[**As noted for claim 29, CHAN teaches a “second computer” or server **10** which accesses a “database of color information”**].**

Regarding claim 31, CHAN *does not specifically teach* ~~a~~ the data carrier system ~~in accordance with~~ according to claim 29, wherein

> **the color data is further generated by:**
>
> **d) representing the at least one of the digitized discrete spectral color values by means of ~~at least one~~ a reflectance curve specified in regular intervals~~,~~**
>
> **~~wherein over at least a part of the color gamut, the digitized discrete color spectral values are equidistant to each other with respect to the color gamut~~.**

As noted for claim 29, SENN et al. teach the generation of "a table of color coordinates with their corresponding *spectral curves*" which becomes a color palette.

Regarding claim 32, CHAN further teaches ~~a~~ the data carrier system ~~in accordance with~~ according to claim 29, wherein

> **the digitized discrete spectral color values are processable *by a computer configured to read out* the color data from the *computer readable medium* to generate or reproduce standardized colors**
>
> **[**CHAN teaches that the "second computer" or server 10 "selects an ink formulation and transmits the *color data associated with the selected formulation* to the first computer 4, *where the color of the selected ink formulation can be viewed on color monitor 6*"; **col. 3, lines 31 – 35].**

Regarding claim 34, CHAN further teaches ~~a~~ the method ~~for generating a digital color standard system for the generation or reproduction of standardized colors in accordance with~~ according to claim 1, further comprising

> **processing the digitized discrete ~~color~~ spectral color values**
>
> **[**"Processing" of the digitized color values may include the transmission of such values from the "second computer" to the "first computer", including the display of such values on a monitor.

"The second computer **10** (illustrated as the server) selects an ink formulation and transmits the color data associated with the selected formulation to the first computer **4**"; **col. 3, lines 31 – 33.**

Furthermore, a software package "converts the spectral data of a color that is input from the computer 4 or the database software 22 to the digital information that will produce the same color on the screens of monitor 6 and 16"; **col. 3, lines 52 - 55].**

Regarding claim 35, CHAN further teaches ~~a~~ the computer system ~~in accordance with~~ according to claim 18, wherein

**the processor is further programmed to provide the color gamut**

**[**As noted for claim 18, the "second computer" or server may provide the "divided" and "digitized" color gamut to a "first computer" where it can be displayed on a monitor; **col. 3, lines 31 - 35].**

Regarding claim 37, *CHAN does not specifically teach* the method according to claim 1, wherein

**the at least another of the discrete spectral color values includes the plurality of colors associated with the at least one of the discrete spectral color values.**

However, as noted for claim 1, SENN et al. teach “circles of constant color saturation (i.e., chroma)” with varying hue (or “colors”).

Regarding claim 38, *CHAN does not specifically teach* the method according to claim 1, wherein

> **the at least one of the discrete spectral color values manifests a first closed loop through the color gamut including all of the colors of the color gamut, each with the first saturation.**

However, as noted for claim 1, SENN et al. teach “circles (or “loops”) of constant color saturation (i.e., chroma)” with varying hue (or “colors”).

Regarding claim 39, *CHAN does not specifically teach* the method according to claim 38, wherein

> **the at least another of the discrete spectral color values manifests a second closed loop through the color gamut including all of the colors of the color gamut, each with the second saturation.**

However, as noted for claim 1, SENN et al. teach “circles (or “loops”) of constant color saturation (i.e., chroma)” with varying hue (or “colors”).

Regarding claim 40, *CHAN does not specifically teach* the method according to claim 1, wherein

> **the first color falls within the at least a part of the color gamut.**

SENN et al. further describe a method for obtaining the "actual formulation" based on a set of real, physical "base colors", and cite, "The primary object of the color mixing program consists in the reproduction of an original color with a certain number of base colors ... This is achieved by synchronizing the spectral curves or the colorimetric values (color coordinates) of original and recipe"; **col. 5, lines 57 – 63.**

That is, the "first color" is selected so that it can be reproduced by the set of real, physical base colors.

Regarding claim 41, *CHAN does not specifically teach* the computer system according to claim 18, wherein

> **the at least another of the discrete spectral color values includes the plurality of colors associated with the at least one of the discrete spectral color values.**

However, as noted for claim 1, SENN et al. teach "circles of constant color saturation (i.e., chroma)" with varying hue (or "colors").

Regarding claim 42, *CHAN does not specifically teach* the computer system according to claim 18, wherein

> **the at least one of the discrete spectral color values manifests a first closed loop through the color gamut including all of the colors of the color gamut, each with the first saturation.**

However, as noted for claim 1, SENN et al. teach "circles (or "loops") of constant color saturation (i.e., chroma)" with varying hue (or "colors").

Regarding claim 43, *CHAN does not specifically teach* the computer system according to claim 42, wherein

> **the at least another of the discrete spectral color values manifests a second closed loop through the color gamut including all of the colors of the color gamut, each with the second saturation.**

However, as noted for claim 1, SENN et al. teach "circles (or "loops") of constant color saturation (i.e., chroma)" with varying hue (or "colors").

Regarding claim 44, *CHAN does not specifically teach* the computer system according to claim 18, wherein

> **the first color falls within the at least a part of the color gamut.**

SENN et al. further describe a method for obtaining the “actual formulation” based on a set of real, physical “base colors”, and cite, “The primary object of the color mixing program consists in the reproduction of an original color with a certain number of base colors ... This is achieved by synchronizing the spectral curves or the colorimetric values (color coordinates) of original and recipe”; **col. 5, lines 57 – 63.**

That is, the “first color” is selected so that it can be reproduced by the set of real, physical base colors.

Regarding claim 45, *CHAN does not specifically teach* the data carrier system according to claim 29, wherein

> **the at least another of the discrete spectral color values includes the plurality of colors associated with the at least one of the discrete spectral color values.**

However, as noted for claim 1, SENN et al. teach “circles of constant color saturation (i.e., chroma)” with varying hue (or “colors”).

Regarding claim 46, *CHAN does not specifically teach* the data carrier system according to claim 29, wherein

**the at least one of the discrete spectral color values manifests a first closed loop through the color gamut including all of the colors of the color gamut, each with the first saturation.**

However, as noted for claim 1, SENN et al. teach "circles (or "loops") of constant color saturation (i.e., chroma)" with varying hue (or "colors").

Regarding claim 47, *CHAN does not specifically teach* the data carrier system according to claim 46, wherein

**the at least another of the discrete spectral color values manifests a second closed loop through the color gamut including all of the colors of the color gamut, each with the second saturation.**

However, as noted for claim 1, SENN et al. teach "circles (or "loops") of constant color saturation (i.e., chroma)" with varying hue (or "colors").

Regarding claim 48, *CHAN does not specifically teach* the data carrier system according to claim 29, wherein

**the first color falls within the at least a part of the color gamut.**

SENN et al. further describe a method for obtaining the "actual formulation" based on a set of real, physical "base colors", and cite, "The primary object of the color mixing

program consists in the reproduction of an original color with a certain number of base colors … This is achieved by synchronizing the spectral curves or the colorimetric values (color coordinates) of original and recipe"; **col. 5, lines 57 – 63.**

That is, the "first color" is selected so that it can be reproduced by the set of real, physical base colors.

## *Conclusion*

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- U.S. Patent 5,798,943 (Cook et al.)
- U.S. Patent 6,349,300 B1 (Graf et al.)
- U.S. Patent 6,842,654 B2 (Lawn et al.)
- U.K. Patent Application GB 2361158 A (Durnian and Dornan)
- U.S. Patent 6,563,510 B1 (Rice et al.)
- U.S. Patent 7,180,524 B1 (Axelrod)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter L. Cheng whose telephone number is 571-270-

3007. The examiner can normally be reached on MONDAY - FRIDAY, 8:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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